

DROWSINESS WARNING DEVICE AND NECK SUPPORT

BACKGROUND OF THE INVENTION

This invention relates generally to neck supports and devices intended to keep a wearer from falling asleep. More specifically, the present invention relates to a drowsiness warning device and neck support which provides a tactile and aural warning to a wearer as he or she becomes drowsy and the chin comes into contact with the device.

It is well known that many traffic accidents are caused by driver drowsiness and inattention to the road which occurs most frequently during long distance drives. The seriousness of the problems is emphasized by the number of people who lose their lives in such traffic accidents and the amount of property damage caused.

To prevent oneself from falling asleep at the wheel, many drivers take stimulants to help them stay awake. The problem is particularly acute in the case of truck and bus drivers who routinely drive long distances.

Accordingly, there has been a need for some type of device capable of alerting a driver that he or she is becoming drowsy at the wheel. In this regard it is known that the human chin droops naturally when one begins to feel sleepy or drowsy. A device, then, is needed which may be worn by a driver and provide an alarm when the driver's chin droops. Such a device must be comfortable to wear and, preferably, provide both tactile and aural warning. Further, such a device is needed which can provide some support to the neck in the case of an accident. The present invention fulfills these needs and provides other related advantages.

SUMMARY OF THE INVENTION

The present invention resides in a drowsiness warning device and neck support which is comfortable to wear, inexpensive to manufacture, and which satisfies all of the foregoing needs. The drowsiness warning device comprises, generally, a band securable about a wearer's neck, and alarm means positioned by the band below a wearer's chin for producing a tactile and an aural warning as the chin contacts the alarm means. The alarm means includes an upper rounded dome extending above an upper edge of the band immediately below the chin, a lower elongated body secured within the band and sound generation means activated by depressing the upper rounded dome with the chin.

In one preferred form of the invention, the band includes a central section which provides means for holding the lower body of the alarm means, a pair of straps including hook and loop tape fasteners and which define opposite ends of the band, and intermediate sections between the straps and the central section. The intermediate sections comprise a vertically stiff, exteriorly facing support member, a fibrous interiorly facing lining adjacent to the support member, and upper and lower edge guards extending over, respectively, upper and lower edges of the support member and the adjacent lining. The straps are connectable to one another for securing the band about the wearer's neck.

The central support comprises a vertical wall having a pair of parallel, generally horizontally extending slots cut therein to define an upper front support segment, an intermediate rear support segment and a lower front support segment between which the lower body of the alarm means is positioned. The vertical wall further includes a lower

support tab which engages a bottom end of the lower body of the alarm means to limit downward movement thereof relative to the vertical wall.

The sound generation means comprises a hollow elastomeric ball, a portion of which forms the upper rounded dome, and a mechanical noisemaker disposed at least in part in a lower end of the ball. The mechanical noisemaker comprises an air actuated flute means positioned adjacent to an air inlet/outlet aperture for the elastomeric ball.

In another preferred form, the sound generation means comprises an electrically actuated speaker which is connectable to a battery on depression of the upper rounded dome. The upper dome includes a pair of upper contact plates, and the lower body includes a facing pair of lower contact plates. The alarm means includes spring means for urging the upper dome away from the lower body to space the upper plates from the lower plates in the absence of a counter-spring force applied by the chin to depress the upper dome and bring the upper and lower plates into contact to close the circuit between the speaker and the battery. Further, the sound generation means includes a printed circuit board for controlling the audio signal to the speaker.

Other features and advantages of the present invention will become apparent from the following more detailed description, taken in conjunction with the accompanying drawings which illustrate, by way of example, the principles of the invention.

BRIEF DESCRIPTION OF THE DRAWINGS

The accompanying drawings illustrate the invention. In such drawings:

FIG. 1 is an elevational view illustrating the manner in which a drowsiness warning device embodying the invention is worn about a wearer's neck so as to position an upper elastomeric dome immediately below the wearer's chin;

FIG. 2 is a view similar to FIG. 1, illustrating the manner in which the chin engages the dome which, in turn, produces a tactile and an aural warning intended to alert the wearer of his or her drowsy condition;

FIG. 3 is an enlarged perspective view of the drowsiness warning device shown in FIGS. 1 and 2;

FIG. 4 is an enlarged sectional view taken generally along the line 4—4 of FIG. 3, illustrating the specific construction of an intermediate section of a neck band of the drowsiness warning device;

FIG. 5 is a fragmented elevational view of the neck band of FIG. 3, illustrating, to the left of a center line, the outside surface of the neck band, and, to the right of the center line, an inside surface;

FIG. 6 is an enlarged, fragmented and partially sectional view taken generally along the line 6—6 of FIG. 3, illustrating one embodiment of an alarm device supported within a central section of the neck band;

FIG. 7 is an enlarged sectional view illustrating the components of an alternative form of the alarm device including an electrically actuated speaker; and

FIG. 8 is an exploded perspective view of the alarm device illustrated in FIG. 7.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

As shown in the drawings for purposes of illustration, the present invention is concerned with a drowsiness warning device and neck support, generally designated in the accom-